9/3/2015

⇒ Fractional numbers

- fixed point
- floating point

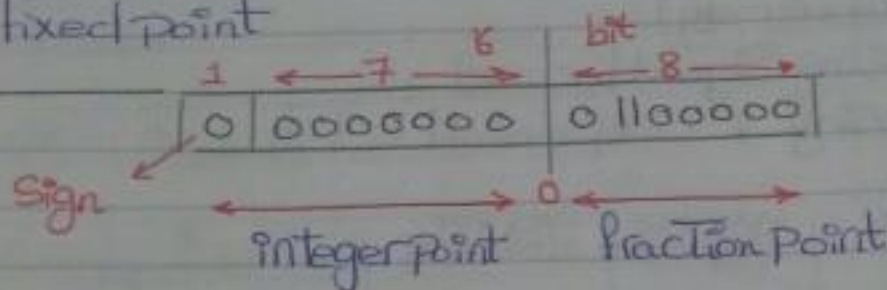
⇒ Flow Chart

⇒ C - programming

- In Computer we represent fractional numbers in 2 ways

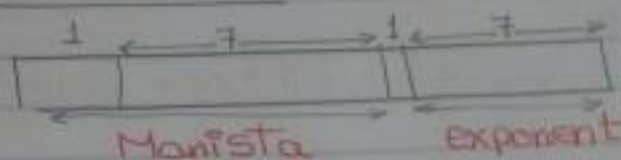
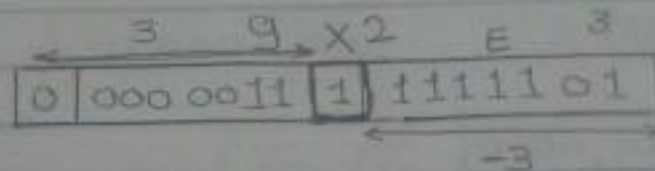
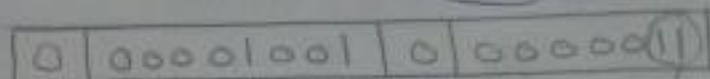
[1] fixed point

1	← 7 → (16 bit)	← 8 →
0	0000000	01100000

Sign ; integer point ← 0 → fraction point

- This is the easiest but not flexible for very small and very large values.

Signs: 0 → +ve & 1 → -ve

⇒ 3/8 in binary

- maximum ⇒ 1111 111 - 1111 1111
  ≃ 128
- minimum ⇒ 0000 000 - 0000 0001
  (+ve) number (2^{-8})

2 Floating point :-
1
7
1
7
Manista
exponent
M * 2^E
0 | 00001001 | 0 | 0000011
3
9 x2
E
3
0 | 000 0011 | 1 | 1111101
-3
3x2^-3
Sign
M
E
-0.001
-ve
-ve
0.001
+ve
-ve
1000
+ve
+ve
-1000
-ve
+ve
⇒ Find 2's Complement of (3) ?
3 | 2 1
1 | 2 1
0
8bits
0000 0011
2methods
1111 1100
1+
1111 1101
1111 1101
8bits
n7ot (1) ⇒ mn b3dh n8yr
el 0 → 1 & 1 → 0
* In C :
float = 16 bits
double = 32 bits

(3)
Maximum → 127 → 127x2^127
Minimum → 1x2^-128
⇒ M * 2^E → 7bits
7bits
0 111 1111 | 0 111 1111
127 127
Max. = 127 x 2^127
0 000 0001 | 1000 0000
1 -128
Min. = 1x2^-128
⇒ Add: 3x2^5 + 7x2^4
M x2 E
0 000 0011 | 0 000 0101
Power = 5
0 000 0111 | 0 000 0100
3x2^5 = 3x2^4 x 2
= 6x2^4
0 000 0110 | 0 000 0100
+
0 000 0111 | 0 000 0100
0 000 1101 | 0 000 0100